

PHYSICS

New Magnetic Particle

When and if discovered, this subnuclear particle may help explain why all electrons carry the same unit amount of negative charge, physicist predicts.

► A NEW subnuclear particle, this one bearing a magnetic charge instead of the more familiar plus or minus electrical charge of the proton or electron, has been predicted.

The new particle has yet to be observed in the laboratory, since its generation by an artificial atomic collision would require energies greater than provided by any present atom smashers. Neither has it been observed in cosmic ray studies, probably because no one was looking for it.

The description of the new magnetic particle, in a very technical article in *THE PHYSICAL REVIEW* (Oct. 1), comes from Dr. P. A. M. Dirac, the British mathematical physicist now working at the Institute for Advanced Study in Princeton, N. J.

Prof. Dirac once before, in 1931, predicted the existence of and properties for an unknown particle. That particle was the positron, and it was then actually discovered about a year later in a cloud chamber photograph by Dr. Carl D. Anderson of the California Institute of Technology.

Why add a new particle to the present long list, especially when the particles now known are so incompletely explained? Prof. Dirac raised that question, and then answered it by saying that the new particle is needed for theoretical reasons. It is needed, he said, in order to help explain why all electrons carry the same unit amount of negative charge. That electric charges, such as those on the electron, pro-

ton or meson, do occur in even multiples of the same electronic unit charge has been known experimentally for a long time. Still, there has been no adequate explanation of this even-multiple type of regularity.

Prof. Dirac now surmises that there is no explanation for the regularity apart from the existence of magnetic particles on the subatomic level. Moreover, if there exists even one of these particles in the universe, this theory requires all electric charges to be even multiples of the electronic charge.

The particle could be created in an artificial collision having an energy of 500,000,000 electron volts, it is estimated. This puts it out of range of even the 184-inch cyclotron at Berkeley, Calif., with its 400,000,000-electron-volt particles, which artificially created mesons. Thus, for the moment, search for such a magnetic particle will have to be made through cosmic ray studies, until the billion-volt generators are completed.

What will it look like? In a cloud chamber, it should give a heavy track of uniform density through its path. This will help distinguish it from such tracks as those of alpha particles, which get denser as the particle slows to a stop. Also, in a strong magnetic field, the new magnetic particle should be deflected toward one of the polepieces, instead of running in circles as electrons and protons do.

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Service. It can be done with a few drops of blood from finger or ear, and takes only five minutes. It is considered a screening test only, and those whom it shows to be probably diabetic will be referred to their doctors for further tests to make certain whether or not they have diabetes.

The reason for two tests, Dr. White explained, is that some persons may have sugar in the urine without having diabetes.

Science News Letter, October 30, 1948

PHYSICS

Uranium Can Be Detected By Spectral Analysis

► VERY SMALL amounts of the atomic energy atom, uranium, can be detected by a new method of spectral analysis reported to the Optical Society of America meeting in Detroit by Dr. L. T. Steadman of the University of Rochester.

Expected to be of use in measuring uranium present in many sorts of materials, the sample is burned in the crater of an electric carbon arc and the light given off is split into its spectrum lines by a quartz spectroscope. The brightness of the uranium lines measured shows the amount of the metal present.

Science News Letter, October 30, 1948



GIANT BIRD BABY—This condor boasts a weight of 19 pounds and 8 ounces—and it's only 13 weeks old. It is the first female Andean condor ever to be born in captivity and it is at the Zoological Gardens of San Diego. When it grows up it will weigh 20 to 25 pounds and have a wing spread of 7 to 9 feet. Condors are not only the largest birds of prey but also the largest land birds of flight.

MEDICINE

Mass Survey for Diabetes

► A MASS SURVEY to detect unsuspected cases of diabetes, aided by a new quick test for sugar in the blood, will be conducted throughout the nation by medical societies and public health authorities during National Diabetes Week, Dec. 6 to 12.

Object of the survey, which will be sponsored by the American Diabetes Association, is to help those who do not know they have the disease to get treatment for it before they get seriously sick with the disease or its complications.

There are 1,000,000 known and 1,000,000 unknown diabetes victims in the United States, Dr. Priscilla White of the Joslin Diabetes Clinic, Boston, reported at a conference in Washington. These figures are based on surveys already conducted in Oxford and Brookline, Mass., and Jacksonville, Fla.

A new kind of insulin, declared by Dr. White to be the "best yet available," is now under trial at the Joslin Clinic and elsewhere. It is known as NPH 50. It is not yet on the market and will not be until production of a uniform product on a large scale is worked out. It is a crystalline protamine insulin. Previous protamine insulins have been amorphous, or non-crystalline. The new insulin combines speed of action with long lasting effects. With the older insulins, a dose each of a fast and of a long-lasting one must be given. This means either two injections or measuring and mixing two doses for a single injection. The new insulin is a one-shot job. It takes effect in two hours and lasts 28 hours.

The new fast test for sugar in the blood, to be used in the mass survey along with tests for sugar in the urine, was developed by scientists of the U. S. Public Health